

Megiddo al. (U.S. Pat. No. 6,182,070, hereinafter the Megiddo reference).

Applicant respectfully traverses the rejections as applied to the claims and requests reconsideration and reexamination of the application for the reasons that follow.

#### Cited References Fail to Identify Problem

The Megiddo reference fails to teach or suggest a method or system for generating association rules as claimed. As set forth in the Background of the patent application, there are limitations and problems with prior art techniques for generating association rules. One challenge is described in the Background of the patent application from page 3, line 23 to page 4, line 6.

One challenge is to provide continuous rather than one-time value to e-commerce. Prior art data mining efforts are focused on analyzing historical data. In reality, however, data is being continuously collected, and it is preferable to have a mechanism that mines data continuously to dynamically detect trends and changes in real-time. For instance, prior art methods are limited to generating a cross-sale association rule that describes the relationship of the past sales of one item to the sales of another item. While such relationships are helpful in making planning and promotion decisions, the changes in cross-sale associations may be even more significant, since such changes usually reflect real-time trends,

the reaction to a promotion, or the cause of sales drops or rises. Unfortunately, the prior art systems are unable to reflect such changes in cross-sale associations. [emphasis added]

A second challenge is described (page 2, lines 5-18) is in the Background of the patent application on page 4 lines 7 to 14.

A second challenge is how to enable a conventional system, which is configured to process small amounts of data, to process very large data sets. In a conventional shopping network, a huge volume of transaction records must be processed everyday, and it is unlikely that centralized processing will yield satisfactory results. The scalability issue becomes more critical in the provision of real-time data mining service described above. In order to scale-up, a mechanism is needed to distribute data processing, reduce data volumes at each local site by summarization, and mine data incrementally at multiple levels of aggregation. Unfortunately, the prior art does not provide a way to perform these tasks on very large data sets. [emphasis added]

The Megiddo reference fails to define or even identify these problems. Furthermore, the Megiddo reference does not offer any solutions to this problem.

Moreover, the Megiddo reference fails to teach or suggest the specific steps or elements recited in the claims as described in greater detail hereinafter.

### Method Claims.

With reference to claim 1, Megiddo fails to teach or suggest the step of "generating an association cube, a population cube and a base cube based on the volume cube," as claimed.

The Action on the top of page 3 states "generating a new cube or cubes from existing cube or cubes is taught by Megiddo et al., which recites 'generating one or more synthetic databases from the dataset, each synthetic database containing a plurality of transactions.'"

Applicant disagrees with the Action's position. It is respectfully submitted that the synthetic database employed in Meggido do not fairly teach the association cube, population cube and base cube, as claimed.

First, the generation of synthetic databases is described in step 112 of FIG. 4 and in col. 7, lines 12 to 15 of Meggido. The synthetic databases are described in the following manner: "one or more smaller databases are generated which are subsets of the original database as described below using a random seed in order to resample the overall database."

Col. 10 lines 18 to 52, further describe how the synthetic databases are generated. Specifically, col. 10 line 21 states "this process is also referred to as determining thresholds by resampling." The purpose of determining a threshold by resampling appears to be to

"generate one or more synthetic data sets of transactions under a model where the occurrences of all of the items are independent (i.e., the transactions are generated independently)."

As is evident, the generation of synthetic databases (also referred to as "determining a threshold by resampling") is very different from the generation of an association cube, a population cube and a base cube based on the volume cube as claimed.

TABLE 1 in col. 11 of Megiddo is also cited for teaching the association cube, the population cube, and the base cube. TABLE 1 illustrates three datasets: SuperMarket, Dept. Store, and Mail Order.

However, the cited TABLE fails to teach or suggest the association cube, a population cube and a base cube as claimed.

Col. 1 lines 18-21 is also cited as teaching the association cube as claimed. Col. 1 lines 18-21 is directed to a general discussion of the desirability of determining customer purchasing behavior. However, the cited portion fails to teach or suggest the association cube, a population cube and a base cube as claimed.

Moreover, even if it were conceded, which it is not, that TABLE 1 and the other portions cited previously teach the association cube, etc., there is no teaching or

suggestion that confidence cubes and support cubes can be derived therefrom as claimed.

Instead, it appears that the datasets of TABLE 1 are used to generate additional synthetic datasets (e.g., Super-Market with 1000 transactions, Super-Market with 10,000 transactions, and Super-Market with 100,000 transactions), which are then in turn used to generate p-values.

Accordingly, the process employed by Megiddo of generating synthetic databases does not teach or suggest the step of "deriving a confidence cube and a support cube of an association rule based on the association cube, population cube, and the base cube" as claimed.

With respect to the dependent claims, the Megiddo reference fails to teach or suggest the additional limitations recited therein.

For example, the Megiddo reference fails to teach or suggest the step of "generating a scoped association rule cube; wherein the step of deriving a confidence cube and a support cube of an association rule based on the association cube, population cube, and the base cube includes the step of deriving a confidence cube and a support cube of a scoped association rule based on the association cube, population cube, and the base cube," as claimed in claim 3.

Additionally, the Megiddo reference fails to teach or suggest the step of "generating an association rule with conjoint items cube," as claimed in claim 4.

Moreover, the Megiddo reference fails to teach or suggest the step of generating a functional association rule cube," as claimed claim 5.

Referring to Claim 17 and the claims dependent thereon, it is respectfully submitted that Megiddo fails to teach or suggest one or more of the following claim elements:

a) mining and summarizing, using a plurality of local servers ("LDOSs"), said transaction data to generate local profile cubes;

b) merging and mining, using at least one global server ("GDOS"), said local profile cubes received from said plurality of LDOSs to generate global profile cubes and association rules based on said local profile cubes; and

c) feeding back said global profile cubes and association rules from said GDOS to said plurality of LDOSs for their business applications.

For example, col. 13, line 52- 55 and col. 9, lines 60-64 fail to teach or suggest the use of local servers and a global server to perform the steps as claimed.

With respect to independent claim 8, the Megiddo reference fails to teach or suggest the following claimed aspect:

a) a plurality of local stations ("LDOSs") having a local computation engine for mining and summarizing the local transaction data and for generating local customer profile cubes.

Furthermore, the Megiddo reference fails to teach or suggest b) at least one global station ("GDOS"), coupled to the plurality of the local stations, the global station having a global computation engine for receiving the local customer profiles, merging and mining the local profile cubes, and generating global profile cubes and association rules based on said local profile cubes, and providing the global profile cubes and the association rules to said plurality of LDOSs, as claimed.

Moreover, the Megiddo reference fails to teach or suggest the specific elements recited in the claims depending upon independent claim 8.

Referring to claim 9, Megiddo fails to teach or suggest one or more of the following claimed elements:

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wherein each of said plurality of LDOSs comprises a  
local data warehouse and at least one local OLAP server,

the local data warehouse being adapted to receive and store said transaction data,

wherein the local computation engine builds the local profile cubes that contains at least partial information regarding customer profiling by periodically mining new transactions flowing into said local data warehouse and deriving patterns for local analysis, said local computation engine also being adapted to incrementally update said local profile cubes.

Referring to claim 10, Megiddo fails to teach or suggest one or more of the following claimed elements:

wherein said local data warehouse receives and stores transaction data in a first predetermined interval and wherein said local OLAP engine generates said local profile cubes in a second predetermined interval.

Referring to claim 11, Megiddo fails to teach or suggest one or more of the following claimed elements:

the global data warehouse for receiving and storing the local profile cubes, and

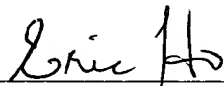
the global computation engine for combining summary information from each of said LDOSs to build and incrementally update said global profile cubes and association rules, and for providing feedback to said plurality of LDOSs.

Accordingly, it is respectfully submitted that the Megiddo, fails to teach or suggest the association rule generation method and system, as claimed.



In view of the foregoing, it is respectfully submitted that all pending claims of the present invention are now in condition for allowance. Reexamination and reconsideration of the pending claims are requested and allowance at an early date solicited. The Examiner is invited to telephone the undersigned if the Examiner has any suggestions, thoughts or comments, which might expedite the prosecution of this case.

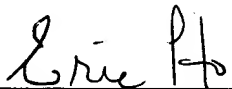
Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231 on the date below.



Eric Ho (RN 39,711)

Dec. 26, 2002  
(Date)